

WHAT IS CLAIMED IS:

1. An apparatus for direct application of a coating medium to a moving fiber material web, said apparatus comprising:

an applicator unit configured for applying the coating medium to the web; and

a roll configured for guiding the web, said roll including:

5 a core having an outer surface;

a compressible covering formed of an elastomeric material, said elastomeric material having a plurality of substantially uniformly distributed cavities, said cavities being of a substantially uniform size; and

a bonding layer joining said covering to said outer surface of said core.

2. The apparatus of claim 1, wherein said covering includes an outer functional layer and at least one intermediate layer disposed within said outer functional layer.

3. The apparatus of claim 2, wherein said outer functional layer is formed of a solid elastomeric material and has a thickness of approximately between 1 mm and 15 mm.

4. The apparatus of claim 2, wherein said at least one intermediate layer is compressible, said at least one intermediate layer having a thickness of approximately between 1 mm and 50 mm, said at least one intermediate layer having a hardness of approximately between 1 P&J and 300 P&J.

5. The apparatus of claim 16, wherein said thickness of said at least one intermediate layer is approximately between 5 mm and 25 mm.

6. The apparatus of claim 4, wherein said hardness of said at least one intermediate layer is approximately between 20 P&J and 150 P&J.

7. The apparatus of claim 2, wherein said cavities are one of filled and open-celled.

8. The apparatus of claim 7, wherein each of said cavities has a diameter of approximately between 0.5 mm and 2 mm.

9. The apparatus of claim 13, wherein said covering is monolithic.

10. The apparatus of claim 9, wherein said covering has a thickness of approximately between 1 mm and 50 mm, said covering having a hardness of approximately between 1 P&J and 300 P&J.

11. The apparatus of claim 10, wherein said thickness of said covering is approximately between 5 mm and 25 mm.

12. The apparatus of claim 10, wherein said hardness of said covering is approximately between 20 P&J and 150 P&J.

13. The apparatus of claim 9, wherein said covering includes a plurality of uniformly distributed cavities, said cavities being one of filled and open-celled.

14. The apparatus of claim 13, wherein each of said cavities has a diameter of less than 30 mm.

15. The apparatus of claim 13, wherein each of said cavities has a diameter of approximately between 0.5 mm and 5 mm.

16. The apparatus of claim 1, wherein said elastomeric material is crosslinked on said core, said elastomeric material being a foam material.

17. The apparatus of claim 1, wherein said compressible covering is an outer covering of said roll.

18. An apparatus for indirect application of a coating medium to a moving fiber material web, said apparatus comprising:

a backing device configured for supporting the web;

an applicator unit configured for applying the coating medium; and

5 a roll defining a press nip with said backing device, said press nip being configured for receiving the web, said roll being configured for receiving the coating medium from said applicator unit and transferring the coating medium to the web in said press nip, said roll including:

a core having an outer surface;

a compressible covering formed of an elastomeric material, said elastomeric material having a plurality of substantially uniformly distributed cavities, said cavities being of a substantially uniform size; and

a bonding layer joining said covering to said outer surface of said core.

19. The apparatus of claim 18, wherein said covering includes an outer functional layer and at least one intermediate layer disposed within said outer functional layer.

20. The apparatus of claim 19, wherein said outer functional layer is formed of a solid elastomeric material and has a thickness of approximately between 1 mm and 15 mm.

21. The apparatus of claim 19, wherein said at least one intermediate layer is compressible, said at least one intermediate layer having a thickness of approximately between 1 mm and 50 mm, said at least one intermediate layer having a hardness of approximately between 1 P&J and 300 P&J.

22. The apparatus of claim 21, wherein said thickness of said at least one intermediate layer is approximately between 5 mm and 25 mm.

23. The apparatus of claim 21, wherein said hardness of said at least one intermediate layer is approximately between 20 P&J and 150 P&J.

24. The apparatus of claim 19, wherein said cavities are one of filled and open-celled.

25. The apparatus of claim 24, wherein each of said cavities has a diameter of approximately between 0.5 mm and 2 mm.

26. The apparatus of claim 18, wherein said covering is monolithic.

27. The apparatus of claim 26, wherein said covering has a thickness of approximately between 1 mm and 50 mm, said covering having a hardness of approximately between 1 P&J and 300 P&J.

28. The apparatus of claim 27, wherein said thickness of said covering is approximately between 5 mm and 25 mm.

29. The apparatus of claim 27, wherein said hardness of said covering is approximately between 20 P&J and 150 P&J.

30. The apparatus of claim 26, wherein said covering includes a plurality of substantially uniformly distributed cavities, said cavities being one of filled and open-celled.

31. The apparatus of claim 30, wherein each of said cavities has a diameter of less than 30 mm.

32. The apparatus of claim 30, wherein each of said cavities has a diameter of approximately between 0.5 mm and 5 mm.

33. The apparatus of claim 18, wherein said roll and said backing device are configured to exert a line force in said press nip, said line force being approximately between 1 kN/m and 100 kN/m.

34. The apparatus of claim 33, wherein said line force is approximately 40 kN/m.

35. The apparatus of claim 18, wherein said roll and said backing device are configured to exert a surface pressure in said press nip, said surface pressure being approximately between 0.01 N/mm² and 2 N/mm².

36. The apparatus of claim 35, wherein said surface pressure is approximately between 0.05 N/mm² and 0.5 N/mm².

37. The apparatus of claim 18, wherein said roll and said backing device are configured to be in contact at said press nip for a length in a direction of web movement, said length being approximately between 20 mm and 200 mm.

38. The apparatus of claim 37, wherein said length is approximately between 30 mm and 150 mm.

39. The apparatus of claim 18, wherein said elastomeric material is crosslinked on said core, said elastomeric material being a foam material.